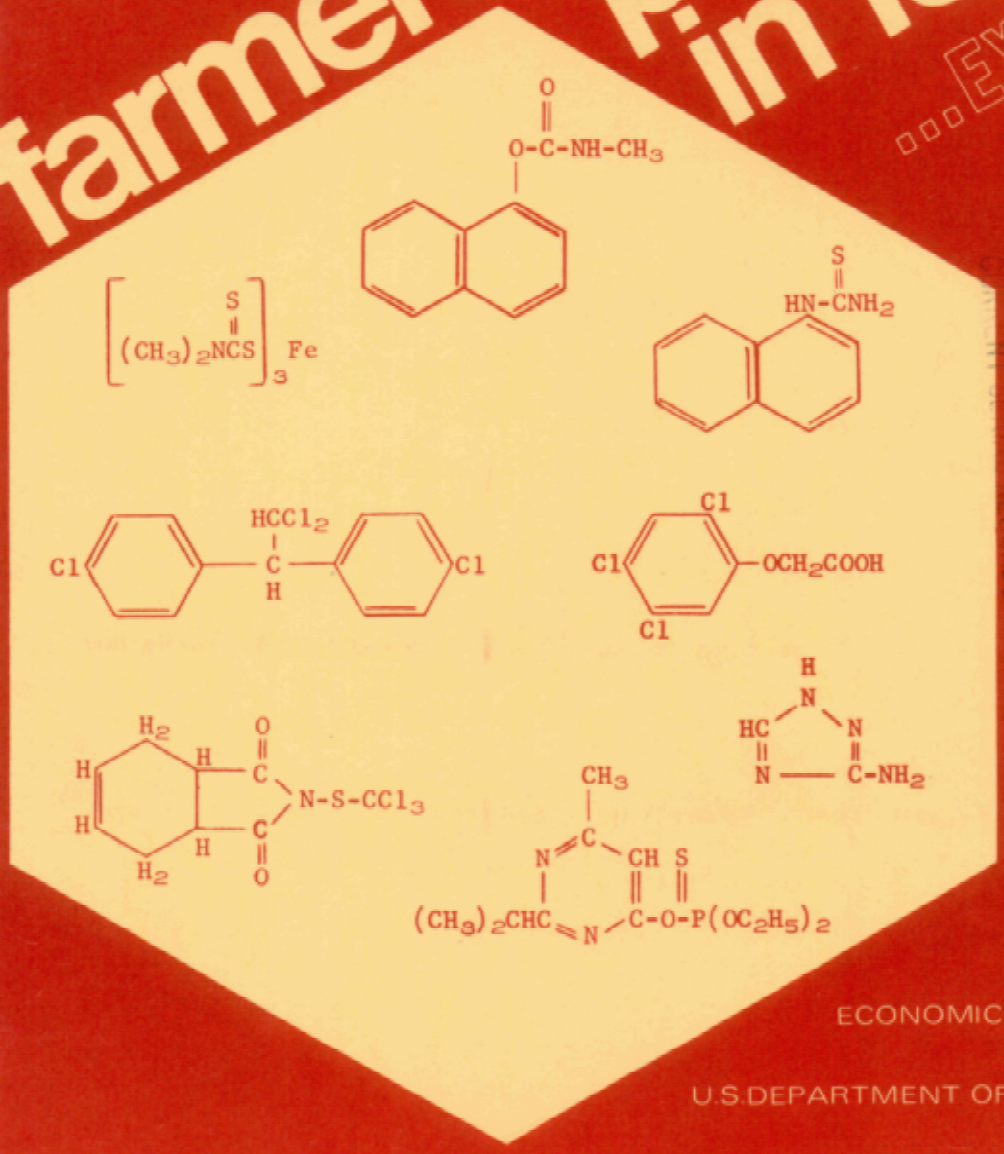
farmers' use of pesticides in 1971

...EXPENDITURES



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FARMERS' USE OF PESTICIDES IN 1971...EXPENDITURES, by Helen T. Blake and Paul A. Andrilenas. National Economic Analysis Division, Economic Research Service, U.S. Department of Agriculture. Agricultural Economic Report No. 296.

ABSTRACT

Farmers' total expenditures on pesticides in 1971 exceeded $1 billion, nearly 80 percent more than in 1966. Based on a 1972 survey of 8,600 U.S. farmers (Alaska excluded), crop protection required $943 million in pesticides, 86 percent higher than in 1966. By type of pesticide, herbicides made up 62 percent of total crop pesticide costs; insecticides, almost 26 percent; fungicides, over 6 percent; and other types, 6 percent. Costs for pesticides used on livestock and their surroundings reached over $44 million, close to a 50-percent rise over 1966 costs. Pesticide expenses for other farm uses amounted to $15 million.

Key Words: Pesticides, fungicides, herbicides, insecticides, crops, livestock.

Washington, D.C. 20250

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PREFACE

In 1964, the Congress authorized an expanded program of research on the use of pesticides in agriculture. One phase of this program was a periodic farm survey to obtain information on the use of pesticides in different areas of the country and on different crops and classes of livestock. These data were to provide a basis for estimating the costs and benefits of pesticides and to serve as a measure of changes in pesticide use.

To meet this need for information, the Economic Research Service (ERS) obtained in early 1972 its third measure of the extent of pesticide use by farmers. The information on pesticide use for 1971 was gained as part of the Statistical Reporting Service's (SRS) 1971 Farm Production Expenditure Survey.

Although the Farm Production Expenditure Survey is conducted annually, the pesticide use sections are included once every 5 years, approximately. Thus, they will next be included probably in 1977.

The Standards and Research Division of SRS designed the nationwide sample from which farmers were selected for interview. The Data Collection Branch of SRS helped develop the final format of the pesticide use sections in the Farm Production Expenditure Survey questionnaire. The Branch also supervised collection of the data through their State offices.

Special acknowledgment is made to the farmers who provided the data for the 1971 survey and whose cooperation made this report possible. Others contributing to this report include Herman Delvo, Theodore Eichers, Walter Ferguson, Austin Fox, and Thelma Anderson of the National Economic Analysis Division, ERS.

This report is the third of four to be published on farm use of pesticides in 1971. Farmers' Use of Pesticides in 1971...Quantities, Agricultural Economic Report No. 252, was published in July 1974. Farmers' Use of Pesticides in 1971...Extent of Crop Use, Agricultural Economic Report No. 268, was published in September 1975.

CONTENTS

SUMMARY

Farmers spent over $1 billion in 1971 for pesticide materials to control crop and livestock pests, nearly an 80-percent increase over 1966. Based on a 1972 survey of 8,600 U.S. farmers (Alaska excluded), crop pesticides cost $943 million, an 86-percent increase from almost $506 million spent in the earlier year; livestock pesticide costs totaled $44 million, nearly 50 percent higher. Spending for other uses, however, declined to $15 million in 1971 from $25.5 million in 1966.

By crop, farmers spent the most in 1971 for pesticide materials to use on corn, $325 million, followed by soybeans, $138 million, and cotton, $132 million. Together, these accounted for 63 percent of the total for crop production. Regionally, the same pattern emerged. Outlays reached $176.5 million and $78 million for corn and soybean pesticides, respectively, in the Corn Belt, while cotton pesticide expenditures approached $48 million in the Delta States. The Corn Belt spent the most overall to control crop pests--$274 million. Southeastern and Pacific farmers expended about $107 million in each region; Mountain State farmers, however, spent $27 million.

About 19 percent of the crop acres planted in 1971 received some type of pesticide material, at an average cost of $5.23 an acre. Annual total expenses varied between 70 cents an acre for some grains to $51.20 for apples. Farmers used some type of pesticide on 90 percent or more of acreages in cotton, rice, tobacco, peanuts, citrus, apples, and other deciduous fruits.

Types of pesticides used on crops varied. Herbicides cost farmers $582 million, or 62 percent of total pesticide expenses for crops. Insecticides cost farmers $241 million--25 percent of the crop expenditure total; fungicides took over $60 million, or about 6 percent. Two-thirds of farmers' expenditures on herbicides went to control weeds in corn and soybeans. Insecticide costs for corn and cotton represented about 50 percent of insect control expenses. Peanut farmers spent 28 percent of the fungicide total to control diseases. Generally, farmers needed to spend large amounts on fungicides to control disease in fruits, nuts, and vegetables. Not unexpectedly, total costs were highest in regions where these crops are of major importance.

Farmers also use pesticides in livestock and poultry production. Beef cattle treatments cost $23 million, over one-half of total expenditures for pesticides used on livestock. Treating dairy cattle and buildings cost farmers $12 million, one-fourth of the total. Usually, producers applied these pesticides as sprays, a form which accounted for half the costs of pesticide materials used in livestock and poultry production. Dusts and other forms made up another fourth of such expenditures.

Sprays were the main form of pesticide used in crop production, too. They accounted for 78 percent of all crop pesticide expenditures; granular forms, 16 percent; dusts, 4 percent; and other forms, 2 percent.

By size, farms with annual gross sales of $40,000 and over spent $583 million for pesticide materials in 1971. Though comprising about 11 percent of

all farms, they spent 58 percent of the total. Farms grossing less than $10,000 annually, about 63 percent of all farms, spent over $91 million in 1971 on pesticide materials, about 9 percent of the total outlay.

Spending for uses other than for crop or livestock pesticides declined to a certain extent during the period between the two surveys--from $25.5 million in 1966 to $15 million in 1971. However, most of this decline can be attributed to differences in reporting expenditures for rodent control for each year.

FARMERS' USE OF PESTICIDES IN 1971...EXPENDITURES

By

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INTRODUCTION

In 1971, farmers purchased pesticide materials for the control of weeds, insects, and diseases affecting crops and livestock and for other control purposes. In this report, which contains estimates of their 1971 expenditures plus comparisons with 1966, we present data for each of the major crops and classes of livestock in the 49 States (excluding Alaska) and in each of 10 farm production regions (fig. 1).1/ We also show expenditures by type of pesticide according to their use on crops:

Herbicides (chemicals used to kill or inhibit weeds);

Insecticides (chemicals used to kill or inhibit insects);

Fungicides (chemicals used to kill or inhibit fungi);

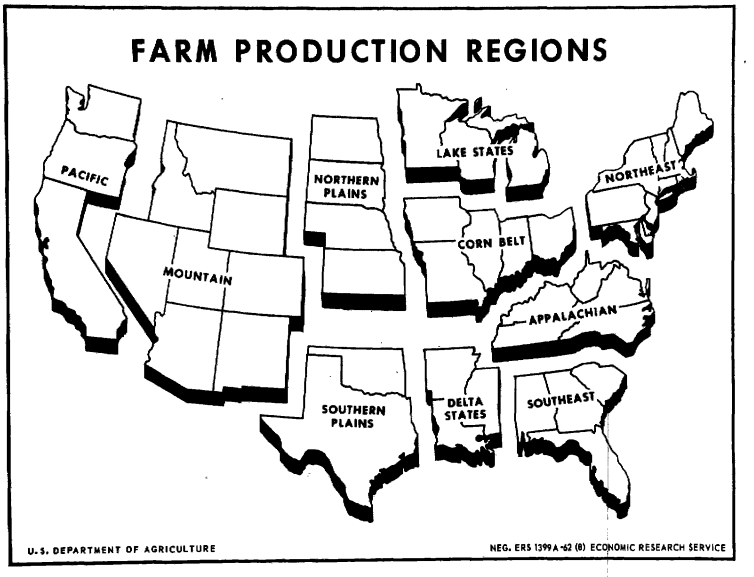

Figure 1

1/ Blake, Helen T., Andrilenas, Paul A., Jenkins, Robert P., Eichers, Theodore R., and Fox, Austin S. Farmers' Pesticide Expenditures in 1966. U.S. Dept. Agr., Econ. Res. Serv., Agr. Econ. Rpt. No. 192, Sept. 1970.

Other pesticides, such as fumigants (chemicals used to treat soil organisms), defoliants and desiccants (chemicals used as harvesting aids), growth regulators (chemicals used to influence plant growth processes), and pesticides for other purposes or combinations of control.

METHODOLOGY

This report is based on personal interviews with about 8,600 farmers in 394 counties throughout the 48 contiguous States and Hawaii (fig. 2). The pesticide use information was gathered as a part of a nationwide survey of farmers' production expenditures for 1971. The interviews provide detailed information on costs of pesticides and quantities of specific pesticide materials used to treat growing crops, stored crops, seeds, livestock, and buildings used to store crops and house livestock. 2/

Selection of farmers for interview was based on a two-stage multiple-frame sample designed to represent all farms in the United States. The first stage of sampling consisted of the selection of counties or groups. These formed the primary sampling units. In the second stage of sampling, farms were chosen within each primary sampling unit.

All data were expanded by a factor unique to each primary sampling unit. Pesticide use data for crops were further adjusted by a factor that reflected the ratio of the number of acres of each crop grown in a production region to

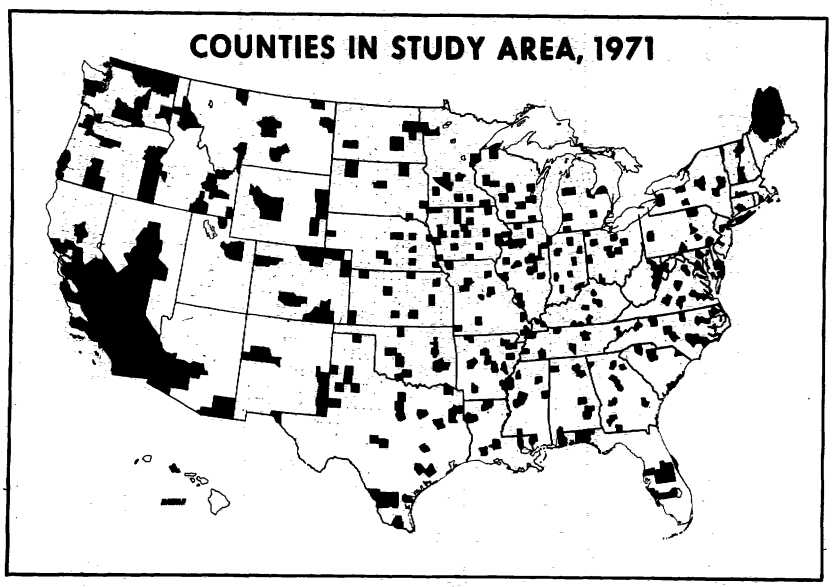

Figure 2

2/ This report is restricted to farmers' expenditures for pesticides.

the number of expanded sample acres of each crop grown on sample farms (fig. 1). Each of 22 classss of crops had an individual adjustment factor for each of the 10 production regions.

The livestock data were expanded only by the unique expansion factor related to the primary sampling unit. Livestock data obtained during the interviews did not provide information to compute an additional adjustment factor similar to that for crop adjustment. Similarly, data for pesticides used for seeds, stored crops, and other purposes were first expanded by expansion factors related to the primary sampling unit, and second, adjusted through use of composites of crop ratios in each region.

For U.S. totals, regional totals were summed for each of 22 classes of crops, 5 classes of livestock, and 5 classes of other farm uses.

Appendix 1 contains regional pesticide expenditures by crop; Appendix 2 shows individual crops discussed in this report and crops included in the grouped categories.

Pesticide usage generally refers to that associated with crops planted for harvest in 1971. Thus, fall seedings from the previous year are included. Also covered are pesticide uses on ungrazed pasture, idle cropland, fence rows, irrigation ditches, roadbanks, abandoned acres, or any other noncropland acres, seeds and stored crops, storage buildings, and seedbeds and transplants.

Pesticide expenditure data in this report do not include materials used in the farm home or garden, disinfectants, medicines taken internally by livestock, or pesticides applied as a part of an organized local, State, or Federal pest control program not paid for by the farmer.

The statistical reliability of the data relates directly to the number of acres treated and the importance of the crop in a region. For example, data for corn in the Corn Belt are more reliable than those for apples in the Delta region, because of the respective importance of the crops to each area. The relative distribution of pesticide expenditures among crops and regions is more reliable than the absolute data for individual crops and regions. Thus, expenditures for pesticides on the major crops in the major production regions should be more accurate than for minor crops.

We present the relative importance of pesticide expenditures on the various crops by size of farm, geographic location, and the types of pesticides and method of application used by U.S. farmers. Value of farm pesticides, frequently shown elsewhere, may be quite different. Costs of pesticides may range from a few cents a pound for a simple inorganic type such as sulfur to several dollars a pound for some of the more complex organic pesticides.

Differences in pesticide use between 1966 and 1971 generally indicate trends. However, because of varying weather and pest infestations plus the limited nature of the sample, some differences could appear between the 2 years which might not reflect basic changes in use patterns.

In both 1966 and 1971, farmers were asked to report the type of pesticide used to control crop pests. Based on their answers, pesticide expenditures were

classified into the following types of control: (1) fungicides, (2) herbicides, (3) insecticides, (4) nematocides, (5) defoliants and desiccants, (6) growth regulators, (7) rodent, bird, and other predator controls, (8) combinations, and (9) other. The combinations include primarily fungicide-insecticides, herbicide-insecticides, and insecticide-nematocides. "Other" includes miticides and all types of pesticides not otherwise classified.

EXPENDITURES FOR ALL PESTICIDES

In 1971, farmers throughout the country paid an estimated $1 billion for all pesticide materials (table 1). Expenditures in crop production amounted to more than $943 million, or 94 percent of the total spent for pest control. Livestock and poultry treatments accounted for 4 percent of the total and other miscellaneous uses, the remaining 2 percent.

Total expenditures for pesticides increased almost 80 percent between 1966 and 1971, from $561 million to more than $1 billion. Expenditures for crop treatment alone went up 86 percent; those for livestock uses rose 50 percent. Pesticide costs for all other uses declined about 40 percent. Higher costs of pesticides during the 5 years resulted from increased use and higher prices. 3/ Because of a difference in reporting expenditures for rodent control in the 2 years, costs of pesticide materials for other uses are not comparable. In 1966, all costs of rodent control were included in other uses. However, in 1971 most of these expenditures were reported as crop treatments.

By Region

The largest pesticide expenditures by any region in 1971 occurred in the Corn Belt--$284 million, or 28 percent of the total spent in the United States (table 1). The Southeast, Pacific, and Lake States regions each spent amounts approaching or exceeding $100 million for pest control. Total pesticide expenditures were substantially higher than 1966 in every region except the Mountain States, where total costs rose only slightly.

By Size of Farm (Gross Sales)

The larger farms--those with annual gross sales of $40,000 or more--spent $583 million for pesticide materials in 1971 (table 2). About 11 percent of all farms, they accounted for 58 percent of total pesticide expenditures and 46 percent of the acres planted. The $40,000-$99,999 group spent the most for pesticides and grew crops on the most acres. The smaller farms--those with annual sales under $10,000--spent $91 million and planted only 18 percent of total acres. They represented about 63 percent of all farms, but accounted for only 9 percent of the total pesticide expenditures.

3/ See source quoted in footnote 1 on page 1 and Andrilenas, Paul. A. Farmers' Use of Pesticides in 1971...Quantities. U.S. Dept. Agr., Econ. Res. Serv., Agr. Econ. Rpt. No. 252, July 1974.

Table 1--Total value of farm pesticide expenditures and distribution by major uses, by region, 1966 and 1971 1/

Region	Crop treatment		Livestock and poultry treatment 2/		Other uses 3/		Total pesticide expenditures	
	1966 4/	1971 5/	1966 4/	1971 6/	1966 7/	1971 6/	1966	1971
	1,000 dollars							
Northeast	32,264	45,504	2,406	3,223	2,422	948	37,092	49,675
Lake States	45,083	94,538	4,009	4,379	1,662	939	50,754	99,856
Corn Belt	112,438	273,948	6,378	8,412	4,019	1,358	122,835	283,718
Northern Plains	30,484	76,697	4,072	7,835	4,088	1,673	38,644	86,205
Appalachian	44,513	64,100	1,650	3,475	4,669	3,717	50,832	71,292
Southeast	61,279	106,546	1,724	4,904	2,436	1,983	65,439	113,433
Delta States	45,397	82,399	1,125	2,668	1,153	452	47,675	85,519
Southern Plains	39,358	65,074	2,978	5,318	1,736	742	44,072	71,134
Mountain	24,318	26,891	3,822	2,499	2,389	1,512	30,529	30,902
Pacific	70,692	107,454	1,306	1,437	984	1,879	72,982	110,770
United States	505,826	943,151	29,470	44,150	25,558	15,203	560,854	1,002,504

1/Does not include Alaska, nor any application charges by custom operators in any of the regions shown. 2/Includes pesticides used for treating cattle, sheep, hogs, poultry, and other miscellaneous livestock and the buildings housing them. Does not include disinfectants or any medicine taken internally. 3/Includes noncropland acres not grazed, fence rows, roadsides, farmsteads, seeds, stored crops, buildings, and seedbeds and transplants. 4/Does not include control of rodents. 5/Includes control of rodents, birds, and other predators on crops. 6/Includes rodenticides. 7/Includes control of rodents in crops, livestock facilities, as well as noncropland acres, fence rows, roadsides, farmsteads, buildings, and seedbeds.

Table 2--Number of farms and pesticide expenditures, by gross sales of agricultural products, 1971 1/

Gross sales	Farms		Pesticide expenditures		Acres grown	
	1,000 farms	Percent	1,000 dollars	Percent	1,000 acres	Percent
Less than $2,500...	1,135	39	21,765	2	51,898	6
$2,500-$4,999.....	349	12	23,322	2	48,267	5
$5,000-$9,999.....	349	12	46,303	5	66,912	7
$10,000-$19,999....	378	13	108,577	11	129,185	14
$20,000-$39,999....	378	13	219,605	22	203,299	22
$40,000-$99,999....	262	9	347,383	35	235,563	25
$100,000 and over..	58	2	235,549	23	197,353	21
All farms.....	2/2,909	100	1,002,504	100	932,477	100

1/Does not include Alaska.

2/The total number of farms is from Farm Income Situation, 1973, U.S. Dept. Agr., Econ. Res. Serv., FIS-222, July 1973. The distribution by gross sales category is based on survey data.

On a percentage basis, all farms with sales of $5,000 or more spent at least 90 percent of their total outlay on pesticides to control crop pests, and farms with sales of $20,000 and over spent at least 95 percent (table 3). Only on farms with sales under $2,500 were the costs for crop treatments less than 89 percent of all pesticide expenditures. The costs of pest control associated with livestock and poultry production ranged from 19 percent of all expenditures for the smallest farms to 3 and 4 percent for the very largest. On farms reporting expenses for "other uses," expenditures for pesticides declined from 3 percent of total expenses for farms with sales under $10,000 to 1 percent of the total for farms with sales of $20,000 or more.

Based on farm size in gross sales, Pacific and Southeastern farms with sales of $40,000 or higher bought the most pesticides, accounting for 75 percent of total pesticide purchases in both regions (table 4). Delta States farmers whose sales exceeded $40,000 accounted for 69 percent of the regional total.

In the Lake States and Appalachian regions, purchases by farms with gross sales of between $10,000 and $40,000 amounted to 47 and 46 percent, respectively, of total pesticide purchases in each of the two regions.

Farms with sales of less than $10,000 did not account for a large share of pesticides used in 1971. In the Appalachian region, they represented 20 percent of all pesticide purchases, and in other regions, somewhat smaller percentages.

Table 3--Total pesticide expenditures and distribution by selected uses, by gross sales of agricultural products, 1971 1/

Gross sales	Total pesticide expenditures	Percentage of total expenditures used for--		
		Crops 2/	Livestock	Other uses 3/
	1,000 dollars	Percent		
Less than $2,500	21,765	78	19	3
$2,500-$4,999	23,322	89	8	3
$5,000-$9,999	46,303	90	7	3
$10,000-$19,999	108,577	93	5	2
$20,000-$39,999	219,605	95	4	1
$40,000-$99,999	347,383	96	3	1
$100,000 and over	235,549	95	4	1
All farms	1,002,504	94	4	2

1/Does not include Alaska. 2/Includes control of rodents, birds, and other predators on crops. 3/Includes noncropland acres not grazed, fence rows, roadsides, farmsteads, seeds, stored crops, buildings, and seedbeds and transplants.

Table 4--Total pesticide expenditures and distribution by gross farm sales class and by region, 1971 1/

Region	Total pesticide expenditures	Distribution by gross farm sales			
		Less than $10,000	$10,000-$39,999	$40,000-$99,999	$100,000 and over
	1,000 dollars	Percent			
Northeast	49,675	10	28	39	23
Lake States	99,856	14	47	25	14
Corn Belt	283,718	8	37	42	13
Northern Plains	86,205	6	37	31	26
Appalachian	71,292	20	46	23	11
Southeast	113,433	8	17	46	29
Delta States	85,519	4	27	31	38
Southern Plains	71,134	11	35	43	11
Mountain	30,902	7	29	32	32
Pacific	110,770	7	18	20	55
United States	1,002,504	9	33	35	23

1/Does not include Alaska.

EXPENDITURES FOR CROP PESTICIDES

In 1971, 55 percent of the U.S. farmers who grew crops used pesticides on them (table 5). Including hay and pasture, 19 percent of the crop acres grown were treated with some pesticide at an average cost of $5.23 an acre. In 1966, 52 percent of the farmers who grew crops treated 14 percent of their crop acreage at an average cost of $3.98 an acre.

Expenditures for all types of pesticides used on crops have increased substantially over time. In 1971, farmers' costs to control crop pests rose to $943 million, compared with the $506 million spent in 1966 and $424 million in 1964. Higher expenditures for pesticides result from several factors. More acres were treated with pesticides in 1971; and for certain crops, more pesticides were used per acre treated. The remaining increase in expenditures is attributed to higher costs for pesticide material. 4/

Corn producers spent $325 million for pesticides used on corn in 1971, over a third of the total spent for all crops and almost two and a half times as much as was spent in 1966 for corn pesticides. Pesticide purchases amounted to $138 million for soybeans and $132 million for cotton. Costs for these three crops alone amounted to $596 million, or about 63 percent of all crop pesticide expenditures. The increase in expenditures for pesticides from 1966 to 1971 for the three crops resulted from an increase in acres planted, expenditures per acre treated, and percentage of acres treated. Soybeans, because they had the greatest proportional growth in percentage of acres treated, showed the sharpest rise in expenditures. Percentage of soybean acres treated with pesticides rose from 30 in 1966 to 72 in 1971. This increase in acres treated contributed substantially to the threefold rise in expenditures for pesticides used on soybeans.

Pesticide purchases for vegetables (except Irish potatoes), sorghum, and peanuts amounted to $39 million each in 1971. For the latter two crops, substantial increases occurred over 1966 figures.

Expenditures on other crops--wheat, rice, other grains, and sugarbeets also went up substantially in 1971 compared with 1966.

Usually, large increases in expenditures accompanied a rise in the number of acres treated. For soybeans, acreage grown went up 16 percent, proportion of acres treated expanded from 30 to 72 percent, and total acres treated jumped 182 percent (table 6). Sorghum acres treated increased 155 percent as farmers planted 26 percent more acres and doubled the share of acres treated. Corn, cotton, wheat, and rice acres treated went up 40-50 percent.

For some crops--tobacco, Irish potatoes, other vegetables, and apples--the acres treated declined, with reductions in both acres grown and percentage treated. For all crops, there were average increases of 5 percent in planted acreage, while the average percentage of acres receiving pest control treatments was almost half again as high in 1971 as in 1966.

4/ See sources quoted in footnote 1 on page 1 and footnote 3 on page 4, and tables 1 and 5 of this report.

Table 5--Extent of use and expenditures for all pesticides used on specified crops, 1966 and 1971 1/

Crop	Farms reporting pesticide use 2/		Acres treated with pesticides		Expenditures for pesticides			
					Total		Per acre treated	
	1966	1971	1966	1971	1966	1971	1966	1971
	Percent		Percent		1,000 Dollars	1,000 Dollars	Dollars	Dollars
Corn	49	68	67	83	134,674	325,268	3.01	5.32
Cotton	63	86	74	90	94,464	132,217	11.73	11.89
Wheat	16	23	30	47	10,011	20,063	.61	.79
Sorghum	31	52	31	63	9,248	38,748	1.71	2.99
Rice	74	91	59	95	6,788	17,009	7.83	9.79
Other grain 3/	16	20	29	34	4,936	9,196	.45	.70
Soybeans	29	63	30	72	45,545	138,088	3.95	4.44
Tobacco	81	90	91	90	20,186	17,966	21.71	23.76
Peanuts	66	86	77	96	11,571	38,702	12.95	26.34
Sugarbeets	49	86	48	82	3,496	14,611	4.62	12.73
Other field crops 3/	37	29	45	46	12,521	17,015	3.80	5.97
Alfalfa	10	7	8	9	8,026	6,795	3.11	2.87
Other hay and forage 3/	2	2	1	1	1,055	578	1.96	1.42
Pasture and rangeland	5	5	1	1	12,562	8,429	1.58	1.22
Irish potatoes	65	78	96	88	14,618	17,862	6.67	14.24
Other vegetables 3/	56	69	78	74	33,242	39,334	10.94	15.97
Citrus	73	67	97	92	21,322	21,449	18.82	19.82
Apples	67	84	93	92	28,974	24,617	54.80	51.20
Other deciduous fruits 3/	80	84	77	90	14,676	23,229	24.69	34.55
Other fruits and nuts 3/	55	66	65	79	4/16,815	4/29,756	15.51	17.04
Summer fallow	4	4	2	2	1,096	2,219	1.46	2.10
Total or average, excluding other hay and pasture	--	--	36	52	492,209	934,144	4.13	5.39
Total or average, including other hay and pasture	52	55	14	19	505,826	943,151	3.98	5.23

1/ Does not include Alaska. Includes pesticides used for controlling rodents, birds and other predators on crops, but excludes those rodenticides or other pesticides used for treating seeds, stored crops, storage buildings, and seedbeds and transplants. 2/ Farms using pesticides on specified crop as a percentage of farms growing the crop. 3/ Crops included in this category are listed in appendix 2. 4/ Also includes pesticide expenditures for nursery and greenhouse products.

Table 6--Total crop acres grown, percentage treated with any pesticide, and percentage change, 1966 and 1971 1/

Crop	Acres grown		Acres treated		Change from 1966 to 1971	
	1966 2/	1971 3/	1966	1971	Acres grown	Acres treated
	Million acres	Million acres	Percent			
Corn	66.3	74.1	67	83	+ 12	+ 38
Cotton	10.3	12.4	74	90	+ 19	+ 45
Wheat	54.5	53.8	30	47	- 1	+ 55
Sorghum	16.4	20.8	31	63	+ 26	+ 155
Rice	2.0	1.8	59	95	- 8	+ 50
Other grains 4/	35.6	37.9	29	34	+ 6	+ 26
Soybeans	37.4	43.5	30	72	+ 16	+ 182
Tobacco	1.0	.8	91	90	- 14	- 14
Peanuts	1.5	1.5	77	96	+ 3	+ 28
Sugarbeets	1.2	1.4	48	82	+ 15	+ 92
Other field crops 4/	8.6	6.2	45	46	- 28	- 26
Alfalfa	29.0	27.5	8	9	- 5	+ 3
Other hay and forage 4/	35.8	33.9	1	1	- 5	- 13
Pasture and rangeland	5/544.5	6/563.3	1	1	+ 4	- 4
Irish potatoes	1.5	1.4	96	88	- 4	- 13
Other vegetables 4/	3.7	3.3	78	74	- 11	- 14
Citrus	5/ 1.2	5/ 1.2	97	92	NA	- 5
Apples	5/ .7	6/ .5	93	92	- 22	- 23
Other fruits and nuts 7/	5/ 2.6	6/ 2.4	69	86	- 6	+ 17
Summer fallow	37.0	44.5	2	2	+ 20	+ 92
Total, excluding other hay and pasture	310.5	335.0	36	52	+ 8	+ 54
Total, including other hay and pasture	890.8	932.2	14	19	+ 5	+ 50

NA = not available.

1/Does not include Alaska.

2/Estimates based on Crop Production, U.S. Dept. Agr., Stat. Rptg. Serv., Cr. Pr. 2-2, July 1967.

3/Estimates based on Crop Production, U.S. Dept. Agr., Stat. Rptg. Serv., Cr. Pr. 2-1 (73), January 1973 and Cr. Pr. 2-2 (8-73), August 1973.

4/Crops included in this category are listed in app. 2.

5/Estimates based on 1964 Census of Agriculture.

6/Estimates based on 1969 Census of Agriculture.

7/Crops included in this category are other deciduous fruits and other fruits and nuts listed in app. 2.

By Region

Many factors influence decisions on the amounts to be spent for crop protection in the various production regions of the country. Regions differ in weather conditions, insect problems, and farming practices associated with particular crops. For example, specific crop infestations in certain areas may require larger quantities of pesticides or more expensive pesticides.

Total

Total expenditures for crop pesticides were highest in the Corn Belt at $274 million in 1971 (table 1). This amount was more than two and a half times the $107 million spent in both the Pacific and Southeast regions, which were second and third highest in total dollars spent. Together, the three regions accounted for more than half of the total crop expenditures in the country. 5/

Corn led all of the other crops in pesticide expenditures in 6 of the 10 regions; cotton led in 3; and other vegetables, in the Pacific region. The $176 million spent in the Corn Belt on corn alone exceeded the total amount spent on all crops in each of the other nine regions. Treatment costs of $78 million for soybean acreages in the Corn Belt also amounted to more than the dollars spent for all crop pesticides in five of the regions. Costs for pest control of other crops grown in the Corn Belt were less significant, since corn and soybeans accounted for 93 percent of total crop pesticide expenditures.

In the Pacific region, treatments for all fruits and vegetables accounted for over half the pesticide costs, although the sum involved in protection of the cotton crop was also substantial--about $11 million. Expenditures for sugarbeets in this region rose sharply between 1966 and 1971, accompanied by large percentage increases in both the proportion of farms using pesticides and the acres treated.

Cotton and peanuts accounted for most of the pesticide purchases in the Southeast; growers of each crop spent $29 million. Their combined total represented 53 percent of all crop expenses in the region.

Although total pesticide expenditures were higher than in 1966 in all regions, less was spent in 1971 in some of the regions for crops such as apples, tobacco, alfalfa, and other hay and pasture.

Per Acre

Pesticide costs for six selected crops ranged from a U.S. average of $4.44 an acre for soybeans to $51.20 an acre for apples (table 7). Except for apples, it cost somewhat more to treat an acre of each crop in 1971 than in 1966. There were some downward shifts in one or more regions for each of the six

5/Detailed information on the expenses for pesticides used in crop production for each of the 10 production regions is shown in tables 23-32 of appendix 1.

Table 7--Expenditures per acre for all types of pesticides used on selected crops, by region, 1966 and 1971 1/

Region	Corn		Cotton		Apples		Other vegetables 2/		Tobacco		Soybeans	
	1966	1971	1966	1971	1966	1971	1966	1971	1966	1971	1966	1971
	Dollars											
Northeast	3.61	5.09	---	---	48.06	73.74	12.58	12.52	12.21	6.15	4.11	3.30
Lake States	3.19	5.77	---	---	87.88	37.82	6.54	6.77	3.16	---	4.42	4.93
Corn Belt	2.97	5.55	5.13	12.37	113.62	52.89	11.56	23.50	19.43	9.87	3.94	4.58
Northern Plains	2.57	4.47	---	---	2.50	9.98	2.00	10.00	---	---	3.68	3.53
Appalachian	3.49	5.22	8.56	13.21	54.67	25.55	7.54	18.57	20.43	20.50	3.43	5.31
Southeast	3.28	3.67	16.50	20.99	2.00	45.61	6.70	19.45	34.09	41.11	3.82	4.03
Delta States	3.87	4.17	13.66	15.76	---	---	9.05	5.96	---	---	4.23	4.09
Southern Plains	2.87	4.38	8.22	6.43	1.20	---	7.69	3.79	---	---	3.56	2.60
Mountain	1.27	4.49	24.65	6.44	57.89	36.92	7.26	7.28	---	---	---	---
Pacific	7.12	3.95	21.06	14.40	28.40	43.81	17.62	21.99	---	---	---	---
United States	3.01	5.32	11.73	11.89	54.80	51.20	10.94	15.97	21.71	23.76	3.95	4.44

--- = None reported.

1/ Does not include Alaska. Includes pesticides used for controlling rodents, birds and other predators on crops, but excludes rodenticides and other pesticides used for treating seeds, stored crops, storage buildings, and seedbeds and transplants.

2/ Crops included in this category are listed in app. 2.

crops (generally, where that crop was not of particular importance in the region) but the trend for most of the crops was higher.

The cost to treat an acre of corn rose from $2.97 to $5.55 in the Corn Belt, and from $3.19 to $5.77 in the Lake States. These regions also experienced high per acre costs for soybeans in 1971, where more expensive herbicides were applied at high rates on both corn and soybeans.

The cost to treat an acre of any crop ranged from $0.70 for other grains to $51.20 for apples. The cost for peanuts rose sharply between 1966 and 1971, changing from $12.95 to $26.34. Irish potatoes also cost growers twice as much to treat per acre in 1971 compared with 1966--$14.24 versus $6.67. Sugarbeet costs per acre almost tripled but, for most crops where increased costs of treated acreage occurred, the changes were moderate.

Per acre costs decreased, as did expenditures in 1971, for alfalfa, other hay, pasture and apples. Tobacco was the only other crop with a decline in expenditures from 1966, but the treated cost per acre rose slightly--from $21.71 to $23.76 an acre.

Cotton growers spent about the same amount per acre in 1971 as in 1966--$11.89 compared with $11.73. Costs were higher per treated acre in some of the main cotton-growing regions but they declined in the Pacific, where farmers used more of the inexpensive pesticides, such as sulfur, instead of the more expensive miticides.

Although the annual per acre cost for pesticides used on apples was down nationally, sizable increases occurred since 1966 in two of the regions where apple growing is important. The cost in 1971 was $73.74 per acre in the Northeast and $43.81 per acre in the Pacific, up from $48.06 and $28.40, respectively. Increased use of growth regulators contributed to the higher costs in both regions. In the Northeast, use of more expensive fungicides added to pesticide costs.

The cost to treat an acre of tobacco with pesticides did not change much from 1966 to 1971 in the major tobacco-producing areas. In the Appalachian region, for example, cost remained about the same. In the Southeast, cost per acre increased, possibly because farmers used more herbicides.

Per acre costs for pest control of other vegetables went up only moderately in the Lake States, but they rose more decidedly in the Pacific region, where vegetables lead in money spent for pesticides. The average cost to treat an acre of vegetables in all regions in 1971 was $15.97--almost half again as much as in 1966.

Rice, sugarbeets, and peanuts are economically important in only a few regions, but they require intensive use of pesticides (table 8). For each crop, 1971 annual and regional costs per acre, where reported, exceeded those for 1966. Expenditures per acre for rice amounted to an annual cost of $9.79; for sugarbeets, the total had risen to $12.73 an acre. Higher costs per acre for pesticides on peanuts in the Appalachian and Southeast regions, where they are a leading crop, show up in the national average cost of $26.34 per treated acre.

Table 8--Expenditures per acre for all types of pesticides used on rice, sugarbeets, and peanuts, by region, 1966 and 1971 1/

Region	Expenditures per acre treated					
	Rice		Sugarbeets		Peanuts	
	1966	1971	1966	1971	1966	1971
	Dollars					
Northeast	---	---	7.94	---	---	---
Lake States	---	---	3.52	6.53	---	---
Corn Belt	---	---	7.05	7.76	---	---
Northern Plains	---	---	3.28	12.39	---	---
Appalachian	---	---	---	---	16.91	26.70
Southeast	---	---	---	---	10.20	35.01
Delta States	6.96	7.21	---	---	---	5.16
Southern Plains	10.27	12.48	4.27	---	6.00	8.66
Mountain	---	---	4.81	7.15	3.06	4.63
Pacific	---	13.54	9.74	20.83	---	---
United States	7.83	9.79	4.62	12.73	12.95	26.34

--- = None reported.

1/ Does not include Alaska. Includes pesticides used for controlling rodents, birds and other predators on crops, but excludes rodenticides and other pesticides used for treating seeds, stored crops, and storage buildings.

By Type of Pesticide

Herbicides accounted for $582 million of farmers' pesticide expenses in 1971, 62 percent of all money spent for farm pesticides used on crops. The next largest share of expenses, $241 million or more than 25 percent, went for pesticides to protect growing crops from insects. Fungicides to overcome crop diseases, and a group of other miscellaneous pesticides, such as nematocides, defoliants and desiccants, growth regulators, and so on, each took more than $60 million--about 6 percent of total crop expenditures in 1971.

Herbicides

Farmers' use of herbicides has continued to expand as new selective types have become readily available. These products are useful in controlling many species of weeds, as well as specific weeds in certain crops. They are also adaptable to varying soil conditions or changes in climate.

Herbicide costs in 1971 (tables 9 and 10) far exceeded total expenditures for all crop herbicides in 1966 of $243 million. In 6 of the 10 regions, herbicides accounted for 50 percent or more of total regional expenditures for pest control. Only in the Southeast and Pacific regions did farmers spend less for herbicides than for insecticides.

The average cost of using herbicides reached $3.66 an acre in 1971 for the 159 million acres treated for weed control (table 11). Individual crop costs varied from $0.64 an acre for some grains to $13.40 an acre for the herbicides used on citrus.

For all regions, weed control in corn and soybeans amounted to two-thirds of the total expenditures for herbicides. Farmers spent $257 million to control weeds in corn and another $131 million for soybean herbicides (table 12). About half the expenditures for corn herbicides, or $139 million, was spent by Corn Belt farmers. Corn producers in the Lake States and Northern Plains regions spent $54 million and $25 million, respectively. Corn Belt farmers also spent $77 million for soybean herbicides. Soybean growers in the Delta States region spent another $21 million for herbicides.

Other crops were also important users of herbicides. Expenditures for cotton herbicides were high in both the Delta States and Southern Plains, and sorghum herbicides were the second largest expense in both the Northern and Southern Plains.

Insecticides

In 1971, insecticide expenditures for all crops totaled $241 million, (tables 9 and 10), close to a 25-percent increase from the $195 million spent in 1966. Fifty-seven million crop acres were treated with insecticides at an average cost of $4.20 an acre (table 11).

Together, costs of treating corn and cotton amounted to about half of the insecticide expense for all crops (table 13). Corn insecticides totaled $62 million; cotton expenses, $58 million. More than half the expenditures for corn insecticides were made by farmers in the Corn Belt. Their $34 million exceeded total expenditures for all crops in 7 of the 10 regions. Expenditures

Table 9--Total expenditures for pesticides used on crops, by type of pesticide and by region, 1971 1/

Region	Fungicides	Herbicides	Insecticides	Nematocides	Defoliants and desiccants	Growth regulators	Rodents, birds, and other predators	All combinations 2/	Other types of control 3/	All types of control
	1,000 dollars									
Northeast	9,166	19,838	13,560	27	877	89	142	1,673	132	45,504
Lake States	3,353	77,698	13,116	---	40	140	5	77	109	94,538
Corn Belt	5,955	226,208	40,142	---	162	112	15	1,154	200	273,948
Northern Plains	735	55,735	18,226	1,307	59	121	1	513	---	76,697
Appalachian	3,814	37,397	12,608	2,893	396	5,032	---	1,960	---	64,100
Southeast	20,889	30,438	36,818	1,089	1,821	1,158	---	8,671	5,662	106,546
Delta States	579	53,412	24,040	108	4,123	---	36	96	5	82,399
Southern Plains	2,114	34,521	24,063	346	3,261	---	6	761	2	65,074
Mountain	1,144	13,039	10,179	73	404	1,508	4	472	68	26,891
Pacific	12,642	33,950	48,123	4,041	3,511	688	166	3,491	842	107,454
United States	60,391	582,236	240,875	9,884	14,654	8,848	375	18,868	7,020	943,151

--- = None reported.

1/ Does not include Alaska. Includes nursery and greenhouse and pesticides used for controlling rodents, birds, and other predators on crops, but excludes rodenticides and other pesticides used for treating seeds, stored crops, storage buildings or seedbeds and transplants.

2/ Includes fungicide-insecticides, insecticide-nematocides, herbicide-insecticides, and all other combinations.

3/ Includes miticides and all types of pesticides not otherwise classified.

Table 10--Expenditures for pesticides used on crops, by type of pesticide and region, 1971 1/

Type of control	North-east	Lake States	Corn Belt	Northern Plains	Appa-lachian	South-east	Delta States	Southern Plains	Mountain	Pacific	United States
	Percent										
Fungicides	20.1	3.5	2.2	0.9	6.0	19.6	0.7	3.2	4.3	11.8	6.4
Herbicides	43.6	82.2	82.6	72.7	58.3	28.6	64.8	53.1	48.5	31.6	61.8
Insecticides	29.8	13.9	14.6	23.8	19.7	34.6	29.2	37.0	37.8	44.8	25.5
Nematocides	.1	---	---	1.7	4.5	1.0	.1	.5	.3	3.8	1.1
Defoliants and desiccants	1.9	.1	.1	.1	.6	1.7	5.0	5.0	1.5	3.3	1.6
Growth regulators	.2	.1	2/	.1	7.8	1.1	---	---	5.6	.6	.9
For rodents, birds, and other crop predators	.3	2/	2/	2/	---	---	.1	2/	2/	.1	2/
All combinations	3.7	.1	.4	.7	3.1	8.1	.1	1.2	1.8	3.2	2.0
Other types of control	.3	.1	.1	---	---	5.3	2/	2/	.2	.8	.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

--- = None reported.

1/ Does not include Alaska. Includes pesticides used for controlling rodents, birds, and other predators on crops, but excludes rodenticides and other pesticides used for treating seeds, stored crops, storage buildings, and seedbeds and transplants.

2/ Less than 0.1 percent.

Table 11--Acres treated and expenditures per acre for selected types of pesticides, 1971 1/

Crop	Fungicides 2/		Herbicides 3/		Insecticides 4/	
	Acres treated	Cost per acre	Acres treated	Cost per acre	Acres treated	Cost per acre
	1,000 acres	Dollars	1,000 acres	Dollars	1,000 acres	Dollars
Corn	741	5.50	58,503	4.40	20,476	3.04
Cotton	494	2.30	10,131	5.89	7,537	7.65
Wheat	---	---	22,062	.69	3,767	1.17
Sorghum	5/	5/	9,548	2.86	8,095	1.40
Rice	---	---	1,735	8.43	639	2.52
Other grains 6/	379	.22	11,755	.64	1,138	1.35
Soybeans	869	.90	29,561	4.42	3,478	1.83
Tobacco	59	1.02	59	11.10	645	10.28
Peanuts	1,300	13.04	1,407	7.36	1,330	6.21
Sugarbeets	183	2.97	1,053	9.89	411	7.10
Other field crops 6/	62	1.44	2,476	4.66	805	6.20
Alfalfa	5/	5/	275	4.29	2,203	2.50
Other hay & forage 6/	---	---	339	1.03	5/	5/
Pasture & rangeland	---	---	5,633	1.45	---	---
Irish potatoes	702	6.19	730	4.46	1,103	5.98
Other vegetables 6/	600	8.49	1,333	7.81	1,866	10.60
Citrus	684	1.96	259	13.40	1,038	4.37
Apples	351	24.01	183	3.76	477	27.12
Other deciduous fruits 6/	402	20.23	142	7.16	648	20.50
Other fruits and nuts 6/	782	10.53	578	7.05	1,208	6.65
Summer fallow	---	---	889	2.50	---	---
All crops (including pasture)	7,608	7.79	158,651	3.66	56,874	4.20

--= None reported.

1/ Does not include Alaska. Excludes pesticides used for controlling rodents, birds, and other predators, and treating nursery and greenhouse products, seeds, stored crops, storage buildings, and seedbeds and transplants. 2/ Does not include fungicide-insecticides and other combinations. 3/ Does not include defoliants and desiccants, herbicide-insecticides, and other combinations. 4/ Does not include insecticide-fungicides, insecticide-herbicides, insecticide-nematocides, and other combinations. 5/ Less than 0.5 percent of acres grown. 6/ Crops included in this category are listed in app. 2.

Table 12--Expenditures for herbicides used on selected crops, by region, 1971 1/

Crop	North-east	Lake States	Corn Belt	Northern Plains	Appa-lachian	South-east	Delta States	Southern Plains	Mountain	Pacific	United States
	1,000 dollars										
Corn	14,539	54,354	138,750	25,146	16,876	3,962	1,218	333	1,380	668	257,226
Cotton	---	---	3,817	---	5,613	10,081	22,672	14,643	708	2,141	59,675
Wheat	1	1,457	8	5,729	41	13	---	153	3,079	4,701	15,182
Sorghum	24	---	3,073	13,572	679	369	817	8,292	491	17	27,334
Rice	---	---	---	---	---	---	6,681	4,927	---	3,012	14,620
Other grains 2/	433	1,659	105	2,311	---	6	---	25	1,581	1,423	7,543
Soybeans	736	12,498	77,342	3,893	9,729	5,023	21,208	327	---	---	130,756
Peanuts	---	---	---	---	3,009	6,076	32	1,225	18	---	10,360
Other field crops 3/	99	5,007	757	2,670	505	2,177	211	2	3,227	7,952	22,607
Hay and forage 4/	194	58	127	10	50	42	39	102	50	855	1,527
Pasture and rangeland	4	100	263	1,947	212	187	258	4,214	686	290	8,161
Fruits and vegetables 6/	2,589	2,369	1,849	5/	330	2,017	276	234	1,317	11,929	22,910
All other 7/	1,219	196	117	457	353	485	---	44	502	962	4,335
Total	19,838	77,698	226,208	55,735	37,397	30,438	53,412	34,521	13,039	39,950	582,236

--- None reported.
1/ Does not include Alaska. Excludes herbicides used on seedbeds and transplants.
2/ Crops included in this category are listed in app. 2.
3/ Includes tobacco and sugarbeets as well as other field crops listed in app. 2.
4/ All hay including alfalfa.
5/ Less than $500.
6/ Includes potatoes, citrus, apples, as well as other vegetables, other deciduous fruits, and other fruits and nuts listed in app. 2.
7/ Summer fallow and nursery and greenhouse.

Table 13--Expenditures for insecticides used on selected crops, by region, 1971 1/

Crop	North-east	Lake States	Corn Belt	Northern Plains	Appa-lachian	South-east	Delta States	Southern Plains	Mountain	Pacific	United States
	1,000 dollars										
Corn	673	9,018	34,137	15,157	778	62	57	104	1,892	340	62,218
Cotton	---	---	175	---	2,667	16,965	20,892	10,697	1,814	4,463	57,673
Sorghum	---	---	299	2,287	58	721	347	5,673	1,142	785	11,312
Soybeans	101	---	313	---	1,470	2,670	1,707	106	---	---	6,367
Tobacco	31	---	13	---	3,906	2,681	---	---	---	---	6,631
Peanuts	---	---	---	---	1,082	6,765	7	400	---	---	8,254
Other field crops 2/	417	652	1,496	296	440	646	414	5,588	2,979	8,586	21,514
Irish potatoes	2,140	431	---	458	303	408	---	154	1,325	1,381	6,600
Other vegetables 3/	2,650	934	1,524	---	757	3,390	63	307	514	9,642	19,781
Citrus	---	---	---	---	---	879	---	460	165	3,035	4,539
Apples	5,663	779	1,848	21	697	63	---	---	183	3,684	12,938
Other fruit 4/	1,349	1,295	337	7	275	1,353	553	574	156	15,423	21,322
All other	536	7	---	---	175	215	---	---	9	784	1,726
Total	13,560	13,116	40,142	18,226	12,608	36,818	24,040	24,063	10,179	48,123	240,875

--- = None reported.

1/ Does not include Alaska. Excludes insecticides used for controlling rodents and treating seeds, stored crops, storage buildings, and seedbeds and transplants.

2/ Includes wheat, rice, sugarbeets, alfalfa, other hay, and pasture and rangeland, as well as other grains and other field crops listed in app. 2.

3/ Crops included in this category are listed in app. 2.

4/ Includes other deciduous fruits and other fruits and nuts listed in app. 2.

for insecticides to control cotton insects were largest in the Southern cotton growing areas and higher than for any other crop in the Delta States, Southeast and Southern Plains regions. Corn growers spent $3.04 an acre to treat 20 million acres of corn, and cotton producers averaged $7.65 an acre for the 7.5 million cotton acres treated with insecticides (table 11).

Other field crops, vegetable crops (excluding potatoes), and fruit crops (excluding citrus and apples) also required large outlays for insecticides, accounting for $63 million, or about 25 percent of total insecticide expenditures. In the Pacific region, where total costs of insect control exceeded those of any other region, vegetable and fruit crops accounted for 20 and 32 percent, respectively, of the $48 million spent.

Fungicides

Although they constitute only a small percentage of all crop pest expenditures, fungicides purchased by farmers are essential for treating the diseases that affect crops. Such expenditures increased to more than $60 million in 1971, from the $33 million cost in 1966, and accounted for over 6 percent of total costs for pest control (tables 9 and 10). Fungicide expenditures exceeded 10 percent of the cost of all crop pesticide materials in three regions, reached 20 percent in both the Northeast and Southeast regions, and approached 12 percent in the Pacific region.

The average cost to control diseases in the Nation was $7.79 an acre for all crops, but individual costs ranged from 22 cents an acre for some grains to $24.01 an acre for apples (table 11). Close to 8 million crop acres were treated with fungicides, and treated peanut acreage exceeded 1 million acres.

Farmers paid $17 million to control diseases affecting peanuts, an amount which represented 28 percent of all crop fungicide expenditures (table 14). In the Southeast region alone, the use of fungicides on the peanut crop cost $15 million. Fruits and nuts and vegetables generally required large outlays for fungicides in regions where they are important to the farm economy, and treatment of these crops costs more per acre.

All Other Types

Besides using pesticides to control crop disease, weeds, and insects, farmers use other types to assist them in crop management practices. Examples include controlling soil organisms, setting fruit and controlling tobacco suckers, and harvesting certain crops. In 1971, expenditures for all miscellaneous types reached $60 million, more than 6 percent of the cost for all farm pesticides (tables 9 and 10).

Farmers spent close to $10 million for nematocides in 1971. Tobacco growers in the Appalachian region paid more than $2 million for them, as did vegetable growers in the Pacific region (table 15). Fruit and nut growers in that region spent over $1 million on nematocides.

Expenditures for defoliants and desiccants used on cotton amounted to $13 million, 86 percent of the total spent on these pesticides for all crops

Table 14--Expenditures for fungicides used on selected crops, by regions, 1971 1/

Crop	North-east	Lake States	Corn Belt	Northern Plains	Appa-lachian	South-east	Delta States	Southern Plains	Mountain	Pacific	United States
	1,000 dollars										
Corn	364	89	3,475	---	132	11	---	---	4	---	4,075
Cotton	---	---	---	---	---	27	65	424	12	608	1,136
Soybeans	---	54	637	---	69	4	18	---	---	---	782
Tobacco	---	---	---	---	55	5	---	---	---	---	60
Peanuts	---	---	---	---	1,204	14,726	9	1,011	---	---	16,950
Other field crops 2/	---	42	82	466	6	---	---	172	79	312	1,159
Irish potatoes	2,159	605	---	234	336	275	---	117	89	533	4,348
Other vegetables 3/	158	29	1,440	---	533	1,690	14	66	55	1,107	5,092
Citrus	---	---	---	---	---	656	---	---	---	687	1,343
Apples	4,975	2,080	237	13	650	118	---	---	84	271	8,428
Other deciduous fruits 3/	1,002	358	20	6	692	677	39	---	---	5,337	8,131
Other fruits and nuts 3/	454	96	64	---	83	2,431	434	256	789	3,623	8,230
All other 4/	54	---	---	16	54	269	---	68	32	164	657
Total	9,166	3,353	5,955	735	3,814	20,889	579	2,114	1,144	12,642	60,391

--- = None reported.

1/ Does not include Alaska. Excludes fungicides used for controlling rodents and for treating seeds, stored crops, storage buildings, and seedbeds and transplants.

2/ Includes wheat, other grain, and sugarbeets as well as other field crops listed in app. 2.

3/ Crops included in this category are listed in app. 2.

4/ Primarily nursery and greenhouse.

Table 15--Expenditures for nematocides used on selected crops in selected regions, 1971 1/

Crop	Northern Plains	Appa-lachian	South-east	Pacific	All other regions	United States
	1,000 dollars					
Tobacco	---	2,442	736	---	---	3,178
All fruits and nuts	---	---	78	1,126	22	1,226
All vegetables	---	67	238	2,228	20	2,553
All other crops	1,307	384	37	687	512	2,927
Total	1,307	2,893	1,089	4,041	554	9,884

--- = none reported.
1/Does not include Alaska. Excludes nematocides used for treating seedbeds and transplants.

Table 16--Expenditures for defoliants and desiccants used on selected crops in selected regions, 1971 1/

Crop	North-east	Corn Belt	Appa-lachian	South-east	Delta States	Southern Plains	Mountain	Pacific	United States
	1,000 dollars								
Cotton	---	162	303	1,749	4.073	3,247	145	2,976	12,655
Irish potatoes	854	---	---	---	---	---	48	17	2/1,018
All other crops	23	---	93	72	50	14	211	518	981
Total	877	162	396	1,821	4,123	3,261	404	3,511	2/14,654

--- = none reported.
1/Does not include Alaska.
2/Includes $40,000 spent in the Lake States and $59,000 in the Northern Plains.

Table 17--Expenditures for growth regulators used on selected crops in selected regions, 1971 1/

Crop	North-east	Corn Belt	Appa-lachian	South-east	Mountain	Pacific	All other regions	United States
	1,000 dollars							
Tobacco	63	65	4,977	1,063	---	---	---	6,168
All fruits and nuts	18	47	5	79	1,479	655	140	2,423
All other crops	8	---	50	16	29	33	121	257
Total	89	112	5,032	1,158	1,508	688	261	8,848

--- = None reported.
1/ Does not include Alaska.

(table 16). In major cotton regions, producers spent between $2 million and $4 million to defoliate or desiccate cotton plants. Growers of Irish potatoes spent more than $1 million for desiccants.

Growth regulators, used to control tobacco sucker growth, cost producers about $6 million, mainly in the Appalachian and Southeast regions (table 17). Fruit growers in the Mountain region spent almost $1.5 million for growth regulators.

Pesticides used to control rodents, birds, and other predators of crops cost farmers $375,000. Expenditures for rodent and predator control were greatest in the Northeast and Pacific regions, where rodenticide use in orchards represented a big share of these costs.

Expenditures for all combinations of compounds came to almost $19 million in 1971 (table 9). Dual-purpose types, such as fungicide-insecticides, took $7 million; insecticide-nematocides, $1 million; herbicide-insecticides, less than $2 million; and all other combinations, about $9.5 million.

Farmers spent about $7 million on all other types of pesticides. Miticides used by fruit growers accounted for most of the expenditures in this category.

By Form of Application

In 1971, pesticides applied as sprays accounted for 78 percent of all expenditures for crop pesticides, compared with 76 percent in 1966, which represented a 1-percent gain each from dust and from granular forms (table 18). Average expenditure for dusts declined to 4 percent, while that for granules fell to 16 percent. Other forms of application, including pesticides mixed with fertilizer, remained stable at 2 percent of all costs.

The relative ease of handling spray materials on the farm and their general effectiveness for particular crops and in foliar applications contribute to their popularity. Expenditures for spraying, by crop, ranged between 62 and 99 percent in 1971 and, for more than half or the crops, averaged 90 percent or higher. Peanut growers and producers of other vegetables used sprays to a much greater extent than in 1966, increasing spray applications to 83 percent of all costs. The percentage of total pesticide expenditures for dust or granular forms, however, declined.

Some shifting also occurred from sprays to granular forms. The percentage of expenditures for sprays on nursery and greenhouse products decreased to 62 percent in 1971 while that for granular products rose to 30 percent. Sorghum, rice, and sugarbeet producers increased their use of granular forms, but their proportion of total pesticide expenditures spent for sprays remained high in 1971.

The proportion of expenditures for granular materials went down significantly in corn and soybean production. Although the decrease about equalled the increase in the proportion spent for spray materials, the change did not involve a direct substitution of one for the other. Total expenditures for

Table 18--Expenditures for pesticides, by form of application and crop, 1966 and 1971 1/

Crop	Form of application							
	Dust		Granular		Spray		Other 2/	
	1966	1971	1966	1971	1966	1971	1966	1971
	Percent							
Corn	2	3/	38	30	58	66	2	3
Cotton	9	3	2	2	88	94	1	1
Wheat	3	3/	3/	1	97	99	--	3/
Sorghum	2	2	3	11	94	86	1	1
Rice	1	--	--	10	99	90	--	3/
Other grains 4/	3/	3/	--	1	100	99	--	3/
Soybeans	3	1	40	29	57	69	--	1
Tobacco	8	5	2	9	79	80	11	6
Peanuts	36	12	8	4	53	83	3	1
Sugarbeets	2	1	3	9	95	80	3/	10
Other field crops 4/	1	1	16	6	83	92	3/	1
Alfalfa	2	3/	1	1	96	97	1	2
Other hay and forage 4/	--	3/	1	3/	98	98	1	1
Pasture and rangeland	5	3/	3/	1	95	95	--	4
Irish potatoes	4	3	24	7	70	84	2	6
Other vegetables 4/	8	10	24	3	67	83	1	4
Citrus	3/	3	3/	1	99	95	3/	1
Apples	3	3/	3/	3/	96	99	1	3/
Other deciduous fruits 4/	4	7	3/	1	96	92	--	--
Other fruits and nuts 4/	14	20	3	1	67	74	16	5
Nursery and greenhouse	6	3	2	30	80	62	12	5
Summer fallow	--	--	3/	3/	100	96	--	4
Average	5	4	17	16	76	78	2	2

--- = None reported.

1/ Does not include Alaska. Includes pesticides used for controlling rodents, birds and other predators on crops, but excludes rodenticides and other pesticides used for treating seeds, stored crops, storage buildings, and seedbeds and transplants.

2/ Includes fertilizer-pesticide mixtures and other forms.

3/ Less than 0.5 percent.

4/ Crops included in this category are listed in app. 2.

spray materials on corn and soybeans rose to higher levels, thus increasing their share of total expenditures. Amounts spent for granular material also declined for other field crops and other vegetables.

Pesticides used as dusts are decreasing in importance as a portion of the amount spent for crop pest control. Only in the treatment of other fruits and nuts did farmers spend as much as 20 percent on dusts and, for other vegetables, farm use rose from 8 percent in 1966 to 10 percent in 1971.

EXPENDITURES FOR LIVESTOCK PESTICIDES

Pesticides serve to protect animals and their surroundings from the nuisance of insects and other pests. In 1971, cost of this protection to livestock and poultry producers amounted to more than $44 million (table 19). This sum was half again as much as the $29 million total in 1966.

The Corn Belt, with expenditures totaling over $8 million, had the largest costs for livestock and poultry of any region. Expenses in the Northern Plains fell just under that amount. Together, these two regions accounted for almost two-fifths of the U.S. total, while expenditures in the remaining regions ranged between $1 million and $5 million.

Pesticide costs to beef cattle producers amounted to over half of total livestock expenditures. About 30 percent of the $23 million spent to control such pests came from producers in the Northern Plains. Ranchers and farmers in both the Corn Belt and Southern Plains paid out almost $4 million, accounting for a little more than 16 percent in each region of total expenditures for beef cattle pesticides. In 7 of the 10 regions, pest treatments in beef cattle operations exceeded $1 million.

Treatment of dairy cattle and dairy buildings with pesticides involved spending close to $12 million, or about one-fourth of all expenditures for pesticides by livestock producers. Costs to dairy farmers in the Lake States reached one-quarter of this total at $3 million, while pesticide expenses in both the Northeast and Corn Belt approached $2 million. Except for the Southern Plains, where $1.2 million went for dairy pest control, expenses in the rest of the regions totaled less than $1 million each.

Hog producers spent $5 million for pesticides in 1971. Those in the Corn Belt spent $2 million of this amount. Costs to treat hogs in the Southeast came to almost $1 million, but expenditures among the other regions varied from $53,000 in the Northeast to $750,000 in the Appalachian region.

Poultry producers used $3 million of pesticides in 1971; 61 percent of this total was in the Southeast region. Poultry producers in the Northeast and Corn Belt regions spent nearly $300,000 in each region. Smaller outlays for pest control on poultry in the remaining regions varied from $7,000 in the Southern Plains to $181,000 in the Pacific region.

Sheep producers in the Pacific region spent about $126,000 for pesticides, while those in the Northern Plains spent about half this amount. Expenditures

Table 19--Expenditures for all pesticides used on livestock, by class of livestock and region, 1971 1/

Region	Cattle		Sheep	Hogs	Poultry	Other 2/	Total
	Dairy	Beef					
	1,000 dollars						
Northeast	2,231	370	17	53	298	254	3,223
Lake States	2,936	891	36	385	63	68	4,379
Corn Belt	1,978	3,866	13	2,049	278	228	8,412
Northern Plains	530	6,842	65	365	25	8	7,835
Appalachian	653	1,860	26	750	130	56	3,475
Southeast	446	1,697	3	970	1,743	45	4,904
Delta States	768	1,669	---	81	127	23	2,668
Southern Plains	1,240	3,809	19	121	7	122	5,318
Mountain	336	1,799	31	118	20	195	2,499
Pacific	511	482	126	73	181	64	1,437
United States	11,629	23,285	336	4,965	2,872	1,063	44,150

--- = None reported.

1/ Does not include Alaska. Includes pesticides used for treating livestock and poultry buildings. Does not include disinfectants or any kind of medicine taken internally.

2/ Includes horses, goats, rabbits, mink, and other miscellaneous livestock on farms.

in the other regions reached less than $40,000 in each region.

Miscellaneous or "other" types of livestock required a total of $1 million for pesticide materials. In the Northeast, expenditures totaled $254,000 and in the Corn Belt, $228,000.

Half the pesticides used on livestock and poultry and their surroundings in 1971 were applied as sprays (table 20). Dusts accounted for 25 percent of expenditures, and the remaining 25 percent was applied as dips, baits, and backrubbers.

In the Southeast, Southern Plains, Northeast, and Lake States regions, livestock producers used between 63 and 68 percent of their pesticide purchases as sprays. However, in half the regions, sprays represented less than 50 percent of the total.

Dusts accounted for 40 percent of expenditures in the Delta States and 32 percent in the Northern Plains, but declined in importance elsewhere, from 29 percent in the Appalachian to 16 percent in the Lake States and in the Mountain regions.

Livestock producers in the Mountain region used 47 percent of their expenditures to purchase other forms of pesticide materials, excluding dusts and sprays. Northern Plains and Corn Belt ranchers spent 40 percent and 33 percent, respectively, for these other forms, primarily for beef cattle. In the remaining regions, these other forms accounted for less than 25 percent of expenditures.

EXPENDITURES FOR OTHER PESTICIDE USES

Total amounts spent on pesticides for uses other than crop or livestock pest control reached slightly more than $15 million in 1971, an increase of about 12 percent from 1966 (table 21). These figures do not compare directly, however, because of a change in the reporting procedures for rodent control. Expenditures for rodent control and for noncropland and other uses are included for 1971, but not for 1966.

Costs for treating noncropland amounted to over $3 million and they were highest in the Pacific and Corn Belt regions. Expenditures for other uses totaled $12 million (table 21). Farmers in the Appalachian region spent the most for other uses--about $4 million, mostly to control seedbed and transplant pests (table 22).

Table 20--Total cost of livestock pesticides and distribution by form of application and region, 1971 1/

Region	Expenditures			
	Total	Form of application		
		Dust	Spray	Other 2/
	1,000 Dollars	Percent		
Northeast	3,223	17	65	18
Lake States	4,379	16	68	16
Corn Belt	8,412	22	45	33
Northern Plains	7,835	32	28	40
Appalachian	3,475	29	49	22
Southeast	4,904	26	63	11
Delta States	2,668	40	40	20
Southern Plains	5,318	28	64	8
Mountain	2,499	16	37	47
Pacific	1,437	20	58	22
United States	44,150	25	50	25

1/ Does not include Alaska. Includes pesticides used for treating dairy and beef cattle, sheep, hogs, and poultry, and the buildings in which they are housed. Does not include disinfectants or any medicine taken internally.
2/ Includes dips, rubs, flystrips, and other miscellaneous forms.

Table 21--Comparisons of total pesticide expenditures for specified "other" uses, by region, 1966 and 1971 1/

Region	Noncropland treatment 2/		Other 3/		Total other uses	
	1966	1971	1966	1971	1966 4/	1971
	1,000 dollars					
Northeast	55	53	1,486	895	1,541	948
Lake States	147	510	246	429	393	939
Corn Belt	658	671	567	687	1,225	1,358
Northern Plains	296	181	2,204	1,492	2,500	1,673
Appalachian	178	28	3,278	3,689	3,456	3,717
Southeast	3	78	1,777	1,905	1,780	1,983
Delta States	38	205	479	247	517	452
Southern Plains	33	210	477	532	510	742
Mountain	503	484	824	1,028	1,327	1,512
Pacific	126	816	195	1,063	321	1,879
United States	2,037	3,236	11,533	11,967	13,570	15,203

1/ Does not include Alaska. Expenditures for 1966 do not include rodent control. Expenditures for 1971 include control of rodents, birds, or other predators reported for either noncropland treatment or for other uses. 2/ Includes fence rows, roadsides, farmsteads, and noncropland acres not grazed. 3/ Includes seeds, stored crops, buildings, and seedbeds and transplants. 4/ These figures differ from those published for 1966 by the amount of expenditures for rodent control, which have been deducted.

Table 22--Total pesticide expenditures for noncrop and nonlivestock uses, by region, 1971 1/

Region	Seed treatments and stored crops	Building treatment only	Seedbeds and transplants	Other noncrop-land uses 2/	Total, other uses
	1,000 dollars				
Northeast	624	108	163	53	948
Lake States	141	186	102	510	939
Corn Belt	492	219	66	671	1,358
Northern Plains	1,344	148	---	181	1,673
Appalachian	436	112	3,141	28	3,717
Southeast	1,226	40	639	78	1,983
Delta States	209	24	14	205	452
Southern Plains	463	69	---	210	742
Mountain	999	29	---	484	1,512
Pacific	223	23	817	816	1,879
United States	6,067	958	4,942	3,236	15,203

--- = None reported.

1/ Does not include Alaska. Includes expenditures for rodents, birds, and other predators.

2/ Includes fence rows, roadsides, farmsteads, and noncropland acres that are not grazed.

Table 23--Extent of use and expenditures for all pesticides used on specified crops, all farms, Northeast, 1966 and 1971 1/

Crops treated	Farms reporting pesticide use 2/		Acres treated with pesticides		Total expenditures	
	1966	1971	1966	1971	1966	1971
	Percent				1,000 dollars	
Corn	63	78	68	87	7,075	15,609
Apples	86	96	94	96	8,954	11,894
Other deciduous fruits 3/	95	99	94	98	2,085	2,603
Other fruits and nuts 3/	78	52	94	84	817	1,228
Irish potatoes	95	88	100	99	4,375	6,532
Other vegetables 3/	80	79	89	67	5,232	3,498
Alfalfa	37	13	30	7	2,062	527
Other hay 3/	3	4/	2	4/	306	19
Pasture and rangeland	4/	1	4/	4/	5	4
All other crops	5/	5/	18	25	1,353	3,590
Total	56	60	21	24	32,264	45,504

1/Includes pesticides used for controlling rodents, birds and other predators on crops, but excludes rodenticides and other pesticides used for treating seeds, stored crops, storage buildings, and seedbeds and transplants.
2/Farms using pesticides on specified crops as a percentage of farms growing crop.
3/Crops included in this category are listed in app. 2.
4/Less than 0.5 percent.
5/Data not available.

Table 24--Extent of use and expenditures for all pesticides used on specified crops, all farms, Lake States, 1966 and 1971 1/

Crops treated	Farms reporting pesticide use 2/		Acres treated with pesticides		Total expenditures	
	1966	1971	1966	1971	1966	1971
	Percent				1,000 dollars	
Corn	59	84	66	93	21,079	63,570
Soybeans	31	58	24	71	4,442	12,552
Apples	78	91	97	99	6,379	3,059
Other deciduous fruits 3/	100	100	91	100	1,743	1,601
Other fruits and nuts 3/	96	66	99	95	907	736
Sugarbeets	55	80	58	67	350	900
Other field crops 3/	50	51	52	70	3,596	4,192
Irish potatoes	56	59	99	76	2,392	1,548
Other vegetables 3/	58	59	60	52	2,760	2,290
Wheat	21	37	40	70	237	1,458
Other grains 3/	22	32	34	48	1,019	1,904
All other crops	4/	4/	1	2	179	728
Total	57	70	27	44	45,083	94,538

1/ Includes pesticides used for controlling rodents, birds and other predators on crops, but excludes rodenticides and other pesticides used for treating seeds, stored crops, storage buildings, and seedbeds and transplants.
2/ Farms using pesticides on specified crops as a percentage of farms growing crop.
3/ Crops included in this category are listed in app. 2.
4/ Data not available.

Table 25--Extent of use and expenditures for all pesticides used on specified crops, all farms, Corn Belt, 1966 and 1971 1/

Crops treated	Farms reporting pesticide use 2/		Acres treated with pesticides		Total expenditures	
	1966	1971	1966	1971	1966	1971
	Percent				1,000 dollars	
Corn	68	82	77	90	77,362	176,505
Soybeans	34	72	31	77	23,816	78,328
Other vegetables 3/	54	76	81	98	2,447	5,703
Cotton	77	96	93	98	1,397	4,189
Sorghum	36	58	58	68	1,003	3,372
Apples	51	100	87	100	2,545	2,269
Other deciduous fruits 3/	90	50	99	33	670	366
Other fruits and nuts 3/	28	100	77	100	123	139
Alfalfa	3	8	2	10	224	1,238
Other hay 3/	4/	2	4/	1	8	130
Pasture and rangeland	4	4	1	1	247	263
Sugarbeets	54	100	68	100	181	329
Other field crops 3/	19	22	25	38	1,021	591
Other grains 3/	5/	5	5/	5	5/	272
Tobacco	79	80	79	80	290	128
All other crops	6/	6/	2	1	1,104	126
Total	59	69	33	49	112,438	273,948

1/ Includes pesticides used for controlling rodents, birds and other predators on crops, but excludes rodenticides and other pesticides used for treating seeds, stored crops, storage buildings, and seedbeds and transplants.
2/ Farms using pesticides on specified crops as a percentage of farms growing crop.
3/ Crops included in this category are listed in app. 2.
4/ Less than 0.5 percent.
5/ Data not available separately, but included in "All other crops" in 1966.
6/ Data not available.

Table 26--Extent of use and expenditures for all pesticides used on specified crops, all farms, Northern Plains, 1966 and 1971 1/

Crops treated	Farms reporting pesticide use 2/		Acres treated with pesticides		Total expenditures	
	1966	1971	1966	1971	1966	1971
	Percent				1,000 dollars	
Corn	58	77	60	77	15,608	41,517
Sorghum	45	60	46	70	3,422	15,875
Wheat	31	42	33	48	2,766	5,790
Other grains 3/	37	40	45	45	1,594	2,341
Soybeans	18	48	12	56	1,078	3,893
Sugarbeets	49	95	53	92	277	2,350
Other field crops 3/	36	27	35	31	1,035	1,272
Alfalfa	1	1	1	4/	208	14
Other hay 3/	3	2	3	4/	426	5
Pasture and rangeland	16	16	3	3	2,107	1,979
Irish potatoes	100	90	100	89	1,818	1,157
Summer fallow	5	5	2	2	134	457
All other crops	5/	5/	92	89	11	47
Total	62	72	17	21	30,484	76,697

1/ Includes pesticides used for controlling rodents, birds and other predators on crops, but excludes rodenticides and other pesticides used for treating seeds, stored crops, storage buildings, and seedbeds and transplants.
2/ Farms using pesticides on specified crops as a percentage of farms growing crop.
3/ Crops included in this category are listed in app. 2.
4/ Less than 0.5 percent.
5/ Data not available.

Table 27--Extent of use and expenditures for all pesticides used on specified crops, all farms, Appalachian region, 1966 and 1971 1/

Crops treated	Farms reporting pesticide use 2/		Acres treated with pesticides		Total expenditures	
	1966	1971	1966	1971	1966	1971
	Percent				1,000 dollars	
Corn	30	50	55	74	8,697	17,961
Tobacco	80	92	92	95	13,688	12,156
Soybeans	17	30	41	59	3,724	11,274
Cotton	54	99	82	99	4,291	8,587
Peanuts	72	94	92	99	5,096	7,246
Irish potatoes	3/	66	3/	72	3/	638
Other vegetables 4/	3/	66	3/	75	3/	1,636
Apples	36	65	86	70	5,006	1,376
Other deciduous fruits 4/	3/	100	3/	100	3/	872
Sorghum	3/	50	3/	50	3/	742
Alfalfa	66	37	69	44	1,782	448
Pasture and rangeland	2	2	2	1	443	212
All other crops	5/	5/	13	1	1,786	952
Total	59	52	20	22	44,513	64,100

1/ Includes pesticides used for controlling rodents, birds and other predators on crops, but excludes rodenticides and other pesticides used for treating seeds, stored crops, storage buildings, and seedbeds and transplants.
2/ Farms using pesticides on specified crops as a percentage of farms growing crop.
3/ Data not available separately, but included in "All other crops" in 1966.
4/ Crops included in this categoyy are listed in app. 2.
5/ Data not available.

Table 28--Extent of use and expenditures for all pesticides used on specified crops, all farms, Southeast, 1966 and 1971 1/

Crops treated	Farms reporting pesticide use 2/		Acres treated with pesticides		Total expenditures	
	1966	1971	1966	1971	1966	1971
	Percent				1,000 dollars	
Cotton	63	92	83	99	18,563	28,953
Peanuts	69	85	84	99	6,390	28,076
Other field crops 3/	26	8	62	51	202	2,575
Citrus	68	64	98	92	17,347	14,272
Soybeans	48	57	64	73	3,752	7,789
Irish potatoes	4/	68	4/	99	4/	1,057
Other vegetables 3/	59	39	80	72	2,449	6,039
Tobacco	100	96	100	99	5,574	5,586
Other fruits and nuts 3/	11	53	13	76	574	3,803
Other deciduous fruits 3/	100	46	100	88	3,465	1,717
Corn	13	24	17	33	1,922	4,036
Sorghum	4/	61	4/	92	4/	1,090
Other hay 3/	1	6	3	3	26	47
Pasture and rangeland	1	2	5/	1	321	240
All other crops	6/	6/	27	5	694	1,266
Total	49	34	21	25	61,279	106,546

1/ Includes pesticides used for controlling rodents, birds and other predators on crops, but excludes rodenticides and other pesticides used for treating seeds, stored crops, storage buildings, and seedbeds and transplants.
2/ Farms using pesticides on specified crops as a percentage of farms growing crop.
3/ Crops included in this category are listed in app. 2.
4/ Data not available separately, but included in "All other crops" in 1966.
5/ Less than 0.5 percent.
6/ Data not available.

Table 29--Extent of use and expenditures for all pesticides used on specified crops, all farms, Delta States, 1966 and 1971 1/

Crops treated	Farms reporting pesticide use 2/		Acres treated with pesticides		Total expenditures	
	1966	1971	1966	1971	1966	1971
	Percent				1,000 dollars	
Cotton	74	94	92	99	28,834	47,800
Soybeans	21	61	28	67	8,077	22,982
Rice	72	92	56	94	4,938	6,894
Corn	11	31	23	59	756	1,275
Sorghum	19	54	43	56	277	1,164
Other grains 3/	2	8	3	11	1	40
Other fruits and nuts 3/	25	100	30	100	970	871
Alfalfa	6	24	8	54	12	70
Other hay 3/	1	2	1	1	3	39
Pasture and rangeland	4	5	2	3	198	277
Other field crops 3/	18	17	63	42	643	345
Other vegetables 3/	34	95	96	95	505	338
All other crops	4/	4/	2	11	183	304
Total	35	37	18	36	45,397	82,399

1/Includes pesticides used for controlling rodents, birds and other predators on crops, but excludes rodenticides and other pesticides used for treating seeds, stored crops, storage buildings, and seedbeds and transplants.
2/Farms using pesticides on specified crops as a percentage of farms growing crop.
3/Crops included in this category are listed in app. 2.
4/Data not available.

Table 30--Extent of use and expenditures for all pesticides used on specified crops, all farms, Southern Plains, 1966 and 1971 1/

Crops treated	Farms reporting pesticide use 2/		Acres treated with pesticides		Total expenditures	
	1966	1971	1966	1971	1966	1971
	Percent				1,000 dollars	
Cotton	54	66	59	80	23,435	29,263
Sorghum	11	36	14	56	2,964	14,044
Rice	100	100	100	100	1,850	5,857
Wheat	14	33	11	38	686	3,824
Other grains 3/	8	12	12	22	181	898
Alfalfa	30	17	47	15	472	128
Other hay 3/	6	5	4	3	187	137
Pasture and rangeland	6	6	2	2	5,140	4,359
Peanuts	4/	79	4/	89	4/	3,314
Other fruits and nuts 3/	4/	62	4/	98	4/	819
Other vegetables 3/	78	85	81	65	2,341	628
Corn	10	7	13	14	238	498
Citrus	100	100	89	93	212	460
Soybeans	18	61	29	62	288	433
All other crops	5/	5/	1	1	1,354	412
Total	28	26	6	9	39,358	65,074

1/ Includes pesticides used for controlling rodents, birds and other predators on crops, but excludes rodenticides and other pesticides used for treating seeds, stored crops, storage buildings, and seedbeds and transplants.
2/ Farms using pesticides on specified crops as a percentage of farms growing crop.
3/ Crops included in this category are listed in app. 2.
4/ Data not available separately, but included in "All other crops" in 1966.
5/ Data not available.

Table 31--Extent of use and expenditures for all pesticides used on specified crops, all farms, Mountain region, 1966 and 1971 1/

Crops treated	Farms reporting pesticide use 2/		Acres treated with pesticides		Total expenditures	
	1966	1971	1966	1971	1966	1971
	Percent				1,000 dollars	
Corn	3/	72	3/	65	3/	3,288
Cotton	54	72	72	93	7,242	2,679
Sugarbeets	49	79	42	74	974	2,500
Peanuts	44	53	63	48	18	18
Other field crops 4/	52	56	49	55	1,622	2,916
Irish potatoes	96	74	92	79	919	2,727
Other vegetables 4/	79	92	80	80	1,353	916
Wheat	46	51	49	69	1,963	3,207
Apples	39	61	79	66	1,759	495
Other fruits and nuts 4/	3/	17	3/	99	3/	2,419
Sorghum	3/	51	3/	49	3/	1,634
Other grains 4/	32	36	39	50	966	1,597
Alfalfa	14	9	13	10	2,621	1,055
Other hay 4/	3	2	5/	1	5	32
Pasture and rangeland	6	9	1	5/	2,800	686
Summer fallow	7	11	1	3	281	485
All other crops	6/	6/	37	89	1,795	237
Total	47	46	4	6	24,318	26,891

1/ Includes pesticides used for controlling rodents, birds and other predators on crops, but excludes rodenticides and other pesticides used for treating seeds, stored crops, storage buildings, and seedbeds and transplants.
2/ Farms using pesticides on specified crops as a percentage of farms growing crop.
3/ Data not available separately, but included in "All other crops" in 1966.
4/ Crops included in this category are listed in app. 2.
5/ Less than 0.5 percent.
6/ Data not available.

Table 32--Extent of use and expenditures for all pesticides used on specified crops, all farms, Pacific region, 1966 and 1971 1/

Crops treated	Farms reporting pesticide use 2/		Acres treated with pesticides		Total expenditures	
	1966	1971	1966	1971	1966	1971
	Percent				1,000 dollars	
Other vegetables 3/	69	78	87	87	15,527	18,286
Apples	93	88	95	97	4,324	5,238
Other deciduous fruits 3/	77	86	58	90	5,843	15,830
Other fruits and nuts 3/	73	75	68	81	12,347	14,081
Cotton	70	94	73	98	10,703	10,746
Sugarbeets	20	95	17	90	672	8,532
Other field crops 3/	62	77	65	66	4,017	4,954
Citrus	73	82	93	90	3,763	6,552
Wheat	67	75	80	73	4,094	5,618
Rice	4/	91	4/	94	4/	4,258
Other grains 3/	35	31	44	39	898	1,637
Irish potatoes	33	95	74	98	4,385	3,849
Alfalfa	1	25	9	35	620	2,897
Other hay 3/	3	13	2	6	46	136
Pasture	10	7	1	2	1,234	309
Corn	38	48	44	45	1,296	1,009
Summer fallow	17	13	8	3	431	821
All other crops	5/	5/	28	9	492	2,701
Total	46	53	10	16	70,692	107,454

1/ Includes pesticides used for controlling rodents, birds and other predators on crops, but excludes rodenticides and other pesticides used for treating seeds, stored crops, storage buildings, and seedbeds and transplants.
2/ Farms using pesticides on specified crops as a percentage of farms growing crop.
3/ Crops included in this category are listed in app. 2.
4/ Data not available separately, but included in "All other crops" in 1966.
5/ Data not available.

APPENDIX 2: CROPS INCLUDED IN REPORT

INDIVIDUAL CROPS

- corn
- cotton
- wheat
- sorghum
- rice
- soybeans
- tobacco
- peanuts
- sugarbeets
- alfalfa
- pasture and rangeland
- Irish potatoes
- citrus
- apples

SUMMER FALLOW

OTHER GRAINS

- oats
- mixed grains
- barley
- rye

OTHER HAY

- all hay, other than alfalfa

OTHER VEGETABLES

- cabbage
- carrots
- celery
- lettuce
- onions
- tomatoes
- watermelons
- sweet corn
- snap beans
- spinach
- artichokes
- asparagus
- broccoli
- cauliflower
- cucumbers
- beets
- green peppers
- green peas
- other vegetables

OTHER DECIDUOUS FRUITS

- peaches
- pears
- cherries
- apricots
- plums
- prunes
- nectarines

OTHER FRUITS AND NUTS

- grapes
- avocados
- figs
- blackberries
- blueberries
- boysenberries
- currants
- gooseberries
- loganberries
- raspberries
- strawberries
- almonds
- filberts
- pecans
- walnuts
- olives
- tung nuts

OTHER FIELD CROPS

- grass and hayseed
- buckwheat
- castorbeans
- hops
- lentils
- millet
- mung beans
- peppermint
- spearmint
- rutabagas
- sesame
- spelt
- sunflowers
- velvetbeans
- dry beans
- dry field peas
- flax
- popcorn
- broomcorn
- cowpeas
- sugarcane
- sweetpotatoes

This publication reports research involving pesticides. It does not contain recommendations for their use, nor does it imply that the uses discussed here have been registered. All uses of pesticides must be registered by appropriate State and/or Federal agencies before they can be recommended.

CAUTION: Pesticides can be injurious to humans, domestic animals, desirable plants, and fish or other wildlife — if they are not handled or applied properly. Use all pesticides selectively and carefully. Follow recommended practices for the disposal of surplus pesticides and pesticide containers.